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Appl. No.	: 09/424,210
Applicant	: Jon TSCHUDI
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Examiner	: Colin M. Larose
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REPLY TO EXAMINER'S ANSWER UNDER 37 C.F.R. §1.193(b)(1)

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This is appellant's reply to the Examiner's Answer mailed on January 15, 2004.

In paragraph (5) the Examiner is correct; the reference to claim 1 in the "Summary of the Invention" was in error. Claim 1 has been cancelled. The reference should have been to independent claim 15.

In paragraph (7) the Examiner indicates that appellant's brief provides no reasons for the claim groupings set forth. Appellant respectfully disagrees. The reasons are set forth in the argument portion of the brief as required by 37 C.F.R. §1.192(c)(7). For clarification, appellant states that claim grouping 15-17 is argued to be separately patentable beginning at page 17 of the brief, claim grouping 18-19 is argued to be separately patentable beginning at page 18 of the brief, claim 20 is argued to be separately patentable beginning at page 21 of the brief, claim 24 is believed to be separately patentable because it combines features of claims 15, 18, and 20, claim grouping 21-23 is argued to be separately patentable beginning at page 23 of the brief, and claim grouping 25-28 is argued to be separately patentable beginning at page 24 of the brief.

DISREGARDING OVERLAPPING OR PARTIALLY OVERLAPPING IMAGES AND CONSTRUCTING A 2-D IMAGE FROM ONLY NON-OVERLAPPING IMAGES

While the Examiner agrees that the term "redundant data" in the specification equates with overlapping data, the Examiner contends that the specification does not describe the concept of discarding an entire image if any portion of it overlaps a previous image. Answer at pp. 9-10. Appellant respectfully disagrees.

First, the Examiner ignores appellant's evidence that in the context of this application, neglecting redundant data means discarding images having overlapping data. See Declaration Under 37 C.F.R. §1.132 of Jon Tschudi ("Tschudi Declaration") at ¶11.

Second, the specification specifically explains that "if the fingerprint is moved slowly over the sensor, while the sampling or measuring frequency is high, the redundant data may simply be neglected and the image of the fingerprint is comprised by each second or third set of data." Page 5, lns 31-35 (*emphasis added*). The specification specifically explains that the image is made of each second or third set of data, which necessarily means the set(s) of data between the second or third set of data (i.e., those sets which contain redundant, or overlapping, data) are discarded.

Moreover, each "image" is formed by a single line of sensors, and the sensor array is formed by one or more lines of sensors. Page 3, lines 10-13. If any portion of an image is redundant (i.e., overlaps), it is not possible to disregard only a portion of that image. Since the image width corresponds to data from a single sensor, that data cannot be partially disregarded.

Except for the first image, each image will overlap the image that precedes it, and, except for the last image, each image will be overlapped by the image that follows it. It is only the following image which overlaps a preceding image, not vice versa. By constructing the two-dimensional image with, for example, every other or every third image (depending on the size of image, speed of finger movement, and frequency of sampling), the constructed two-dimensional image is formed with adjacent images having no portions overlapping.

The Examiner further argues that the limitation "disregarding those images which overlap or partially overlap" would render the claimed invention inoperable, because if all of the images that overlap or partially overlap are discarded, then all images will be discarded resulting in no data whatsoever. See Answer at p. 10. Appellant disagrees.

Depending on the width of the image, the speed of finger movement, and the frequency of sampling, the amount of overlap between each image and its preceding image will vary. If images at regular intervals (e.g., every other image, or two of every three images) are neglected, the remaining images will have no portions overlapping.

To use the Examiner's hypothetical of each image overlapping a preceding image by 20% (see Answer at p. 10) the second image overlaps the first image by 20%, the third image overlaps the second image by 20%, etc. The second image would be discarded because it overlaps the first. The third image does not overlap the first and it no longer overlaps the second because the second image has been discarded. So the third image is not discarded. The fourth image overlaps the third image by 20%, so it is discarded. The fifth image is retained; it does not overlap the third image and it no longer overlaps the fourth image which has been discarded. Thus, by discarding every other image (i.e., the even-numbered images) and retaining only the odd-number images, the remaining images of which the two-dimensional image is formed are only non-overlapping images. Stated another way, if each image overlaps the preceding image by 20%, it is not the case that both the first and second images are neglected. Only the following image (i.e., the second image) is the overlapping image. The preceding image (i.e., the first image) does not overlap the following image; it is overlapped by the following image.

The above remarks pertaining to the language of claim 15 also pertain to claims 24 and 25 which include similar limitations.

USING THE ASCERTAINED SPEED TO DETERMINE WHICH OF THE PLURALITY OF IMAGES OVERLAP OR PARTIALLY OVERLAP

With respect to claims 24 and 25, the Examiner further contends in his Answer that "the Specification and the original claims do not expressly disclose 'using the ascertained speed to

determine which of the plurality of images overlap or partially overlap.'" Answer at p. 12. Appellant disagrees. The specification explains:

> Another method for adjusting for the movement of the finger is to maintain the sampling rate at the sensor array, while adjusting the number of measured lines used in generating the segmented image of the surface.... For example, if the fingerprint is moved slowly over the sensor, while the sampling or measuring frequency is high, the redundant data may simply be neglected and the image of the fingerprint is comprised by each second or third set of data. (P. 5, lns 25-35).

The Examiner acknowledges that the term "movement" in the specification is synonymous with the term "speed" as cited in the claims. Answer at pp. 11-12. The previously quoted section of the specification describes a procedure for adjusting for the movement (i.e., speed) of the finger by neglecting redundant data and forming the fingerprint image by each second or third set of data. One of ordinary skill in the art would readily recognize that the amount of image overlap is dependent on the width of the images, the speed of the finger, and the sampling rate. The width of the image is defined by the width of the sensor line and is fixed. Thus, for a given sampling rate (which would typically be fixed) the only variable which determines the amount of overlap is the speed of the finger. See Tschudi Declaration at ¶¶10-11. Thus, the specification does support the limitation of using the ascertained speed to determine which of the images overlap.

USING THE ASCERTAINED SPEED TO DETERMINE THE REQUIRED RELATIVE POSITIONING OF AT LEAST A PORTION OF THE PLURALITY OF IMAGES

Claims 20 and 21 recite "sing the ascertained speed to determine the required relative positioning of at least a portion of the plurality of images to form a two-dimensional image of the fingerprint surface." Using the ascertained speed to determine which of the images overlap as discussed above with respect to claims 24 and 25 is a specific embodiment of the concept of using the speed of the finger to determine the required relative positioning of the images. Accordingly, appellant believes this limitation is sufficiently disclosed in the specification as well.

PRIOR ART REJECTIONS

The Examiner contends that because Mainguet stitches together overlapping images to form a two-dimensional image of a fingerprint, the overlapping portions are essentially disregarded. Answer at p. 15. Appellant respectfully disagrees. Claim 15 specifically recites the steps of "disregarding those images which overlap or partially overlap one of more other images; and constructing a two-dimensional image of the fingerprint surface from only non-overlapping images obtained from said generating step." Mainguet specifically uses overlapping images to construct the two-dimensional image of the fingerprint surface. No images are disregarded. The fact that the overlapping portions of images are superimposed in constructing the two-dimensional image does not mean that any of the superimposed overlapping portions are disregarded and does not mean that the image is constructed of only non-overlapping images.

Accordingly, Mainguet does not anticipate claims 15 or 16.

Regarding independent claim 18 and the rejection in view of Setlak, the appellant respectfully disagrees with the assertion set forth in the Answer that Setlak discloses all of the elements of claim 18. Appellant refers the Board to the argument set forth at pages 18-20 of its Brief.

Regarding claims 20 and 21, the Examiner acknowledges that Mainguet and Upton do not teach "using the ascertained speed to determine the required relative positioning... to form a two-dimensional image of the fingerprint surface." Answer at p. 17. As explained above, appellant disagrees with the Examiner's assertion that there is not sufficient support in the original disclosure for this limitation.

As to claims 24 and 25, the Examine states that "Mainguet and Upton, in combination, teach all of the claimed features [of claims 24 and 25] except 'disregarding [sic, determining] which of the plurality of images overlap... from the speed determined by said two sensing

elements and to disregard those images which overlap or partially overlap,'[1] and 'constructing a two-dimensional image of the fingerprint surface from only non-overlapping images.'" Answer at p. 17 (*emphasis added*). This admission by the Examiner would appear to be at odds with the Examiner's rejection of claim 15, in which the Examiner contends that Mainguet does in fact teach the steps of disregarding overlapping images and constructing a two-dimensional image from only non-overlapping images. Moreover, the Examiner contends that there is insufficient support for these limitations of claims 24 and 25. Appellant disagrees as explained above.

With respect to claims 20, 21, 24, and 25, appellant disagrees with the Examiner's assertion that Upton teaches determining the speed of the finger movement based upon the distance between spaced apart sensors and the time lapse between passage of identical features over the sensors. See page 25 of Appellant's Brief. Moreover, appellant notes that the prior art rejections of claims 20-28 have apparently been withdrawn as set forth in page 18 of the Answer.

[1]This quoted language corresponds only to the language of claim 25. Claim 24 recites "using the ascertained speed to determine which of the plurality of images overlap or partially overlap others of the plurality of images; [and] disregarding those images which overlap or partially overlap one or more other images."

For the foregoing reasons and for the reasons set forth in appellant's Appeal Brief, appellant respectfully requests that all claim rejections be reversed and that this application be passed to allowance.

Respectfully submitted,

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